Case report

A 36-year-old male mechanic presented with progressive generalised motor weakness. Seven days earlier he had sustained a grease gun injection into the right anterolateral area of his neck. He reported mild pain near the injection site but no dyspnoea. He had attended a peripheral hospital, where a debridement was performed but without any further clinical or radiological investigations. Following three days of bed rest without immobilisation of his neck he was discharged, at which stage he had no neurological deficit and could walk independently. However, after 24 hours he was readmitted to the same hospital because of rapidly progressive motor weakness and inability to walk. He was transferred urgently to our hospital with a transport time of about three hours.

On examination there was a 3 cm longitudinal incision from the debridement with mild swelling on the right side of his neck. There was severe motor weakness involving all four limbs but most marked on the right side, with an American Spinal Injury Association (ASIA) motor score of 42 points. Sensory examination revealed slight numbness in the right C5-7 dermatomes. The tendon reflexes were symmetrically reduced, although not absent.

Plain radiographs of the cervical spine revealed subcutaneous emphysema. An emergency CT scan showed an intraspinal space-occupying lesion from C3 to T1 with indentation of the dural sac, thereby narrowing the spinal canal by approximately 30%. The lesion was connected to the prevertebral soft tissue through the right intervertebral foramina, most obviously from C4 to C6 (Fig. 1). An MRI scan, which was compromised by artefact changes, revealed intraspinal low signal intensity on both T1- and T2-weighted images (Fig. 2). The white blood cell count was 12.0 × 10⁹/l, ESR 45 mm/hr and CRP concentration 37.1 mg/l.

It was decided to remove the foreign matter surgically because of the patient's worsening condition. A combined anterior and posterior approach to the cervical spine was undertaken, commencing anteriorly. Yellow-green grease was detected lying on the anterior surface of
scalenus anterior and the lateral surface of longus colli, and connected to the spinal canal through the brachial plexus and intervertebral foramina. A debridement was performed and the grease thoroughly removed. The patient was then placed prone and supported in a head-holder and through a posterior approach the same yellow-green grease was detected between the ligamentum flavum and the epidural space, with dorsolateral indentation of the dural sac. After complete removal of the grease, an open-door laminoplasty was carried out to ensure complete decompression of the spinal cord. Overall, 80 g of grease were removed. There was no significant bleeding following the debridement and both wounds were irrigated copiously with saline before closure.

The patient’s post-operative course was uneventful and six months later he had complete sensory recovery and partial motor recovery, with an ASIA score of 98.

Discussion

A high-pressure injection injury is caused by the introduction of foreign material under pressures between 2000 psi and 10 000 psi. The material is forced through the skin and diffuses along fascial planes, tendon sheaths and neurovascular bundles. Suitable radiographs may help define the extent of the lesion and the foreign material. They can show the quantity and distribution of radio-opaque fluids, and radiolucent substances can be observed as subcutaneous emphysema. CT scan can provide further information and MRI can rule out a space-occupying lesion, such as a haematoma or abscess within the spinal canal. However, artefacts created by the injected foreign material may obscure the most useful images.

Despite the widespread industrial use of high-pressure machines, injuries infrequently arise from their use. Generally they are sustained at work and involve the non-dominant hand, but they rarely affect the neck. We were only able to identify two reported cases, both caused by clean water and neither leading to a neurological deficit.

In our case, the lesions were underestimated because of the small puncture wound, the paucity of initial symptoms, and inadequate initial debridement.

A spinal cord injury from a migrated foreign body is rare. Most cases involve shrapnel or fragments of cutting weapons. Other reports have described the intraspinal migration of surgical implants and, more commonly, broken or non-extractable portions of catheters placed in the spinal canal for therapeutic reasons. As our patient had no neurological symptoms at the time of injury, we suggest that the grease did not enter the cervical spinal canal in the acute phase but, with flexion and rotation of the neck, was disseminated subsequently into the spinal canal along the neurovascular bundles.

The surgical management of retained foreign material should be considered according to the individual case. For patients who present with a stable neurological deficit the management is controversial, but because progressive myelopathy may present several years later, we suggest that retained fragments should be removed in order to avoid subsequent complications.

No benefits in any form have been received or will be received from a commercial part related directly or indirectly to the subject of this article.

References


